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ABSTRACT

A study was made of the relationship between attendance by tribal peasant farmers and leaders at one-week courses in agricultural development held at Domboshawa Training Centre and subsequent changes in the Mtoko district of Rhodesia. The broad aim of the courses was to enable tribesmen to gain a better understanding of the causes of erosion due to lack of conservation farming. Six Headman areas received no training and no extension followup; three received training only; and three received training and followup. Followup extension work emphasized the introduction of new crops (cotton and sorghum) and improving the basic practices in existing crops. Although there are acknowledged weaknesses in the methods of sample selection and data collection, results suggest that the training courses played an important part in initiating increased mechanical conservation (contouring), improved agricultural practices (use of fertilizers), and problem-solving, reflected in group or community projects. The trend was much more definite in the three areas which received extension followup. (PT)

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University of Rhodesia

INSTITUTE OF ADULT EDUCATION

An abbreviated report on:

THE EFFECT OF SHORT INSTITUTIONAL TRAINING COURSES ON AGRICULTURAL DEVELOPMENT IN A TRIBAL TRUST LAND

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OBJECTIVES of the STUDY

This is a summary of an exploratory investigation into the relationship between attendance by tribal peasant farmers and leaders at one-week short courses in agricultural development held at Domboshawa Training Centre near Salisbury and subsequent changes in the Mtoko district of Rhodesia.

The broad objective of the study was to assess the effect of short-course institutional training on subsequent agricultural development in those areas from which the participants were drawn. It was decided to focus the investigation on three aspects of development which made up the three main subject-matter areas taught during the short courses at Domboshawa:-

1. Mechanical conservation.
2. Improved agricultural practices.
3. Problem-solving (at the group or community level).

BACKGROUND

The report of an erosion survey undertaken in Mtoko Tribal Trust Land (TTL) in 1965 (1) concluded:-

> "Without doubt, the area of Mtoko surveyed, is the worst eroded area that has yet been investigated. So bad in fact, that the table of erosion intensity which was quite adequate for the other catchments failed completely when used in Mtoko".

(1) Erosion Survey of a Portion of Mtoko Tribal Trust Land.

Department of Conservation and Extension (Planning Branch) Salisbury, 1965.

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Much of the district falls within agro-ecological regions IV and V (1) which is unsuitable for intensive cropping, thus local agriculture is largely based on the cultivation of millet and production is almost entirely for subsistence. Cash is earned by men working away from home and it is estimated that up to 50% of the able-bodied males are absent from the area at any one time.

In the district as a whole there are nine Chiefs and twenty-two Headmen. The Chief exercises his authority through Headmen and Kraal-Heads in the customary Shona manner. Traditional and superstitious beliefs such as ancestor-worship and witchcraft are strongly and widely held throughout the area - many new practices are only adopted following consultation with and approval by ancestral spirits. Early adopters must be able to withstand very strong social pressures brought upon them to conform to tribal custom.

The district is well provided with schools, built mainly by the people themselves. However, education is generally considered as the means to urban employment and as providing an opportunity to leave the land for ever.

During the past five years there has been little political activity in the area, but prior to this the district was a hotbed of nationalist politics and agitation, with resistance to government soil conservation policies (particularly the Land Husbandry Act) being used as a device to gain popular support. (2).

Many agricultural development projects have been started at various times in the district such as growing mango trees and pig production. It is difficult to assess the impact of these on the tribesmen because of a dearth of written records and a lack of continuity in district agricultural staff. However, the image of 'agricultural extension' in the district is generally good, and the acceptance of the African demonstrator as a 'teacher' of better farming methods has become more widespread since the early 1960s.

In 1965 all Chiefs and Headmen from the Mtoko district were invited to a conference on Conservation Farming at the Domboshawa Training Centre, by the Natural Resources Board. This was a preliminary to the enactment of the Tribal Trust Land Act (1967) under which Tribal Land Authorities (normally the Chief and his Elders) were given control over the allocation and use of land in their areas. This was a return to traditional practice prior to the implementation of the Land Husbandry Act.

Initially the attitude of the vast majority of these traditional leaders was one of complete apathy. However, two of the Chiefs showed interest in Young Farmers' Clubs (YFC) during the conference and requested further information and advice in organising YFCs on their return home.

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(1) A description of agro-ecological regions is given in An Agricultural Survey of Southern Rhodesia, Part I: The Agro-Ecological Survey, by V. Vincent and R.G. Thomas, Federation of Rhodesia and Nyasaland, Government Printer, Salisbury, 1960.

(2) The Land Husbandry Act, which came to a standstill in 1961, was an attempt to control erosion (and increase production) in African tribal areas. It involved the allocation of individual title to arable land, imposed mechanical conservation measures and destocking of livestock where necessary.

With the assistance of the District Commissioner and the Nyamkoho Community Board (a community development committee at the Headman level) agricultural staff assisted the YFC to carry out a 'result demonstration' of improved sorghum at Chifamba School. The plot yielded thirty-two bags to the acre and resulted in greater contact with and increased confidence in the agricultural staff by the parents of the school-children. This led to a request for further help by the Community Board with the planning of a weir to provide water for a cattle dip. This project was also successfully completed.

Increased communication with the people and their greater confidence in agricultural staff led to a request for further short training courses at Domboshawa. These were held mainly for tribal leaders and cultivators during 1967 and 1968. In addition, similar courses were also arranged for women's groups, teachers and youth groups.

THE SHORT COURSES at Domboshawa

Up to June, 1969, 450 tribesmen attended the short courses arranged for Tribal Land Authorities and all participants were selected by Chiefs and Headmen. Over 50% of those selected to attend were in a position of authority in the tribal organisation as shown in Table 1.

TABLE 1

Status of participants attending Tribal Land Authority short courses at Domboshawa

Status	Percentage
Kraal head (village head)	54%
Master Farmer (1)	18%
Cultivators	28%

Approximately 25% of participants had achieved functional literacy (i.e., completion of five years' primary school).

TABLE 2

Educational level of participants attending Tribal Land Authority short courses at Domboshawa

Number of years at Primary School	Percentage
Never attended school	43%
Did not complete Std.3 (less than 5 years)	34%
Completed Std.3 or above (more than 5 years) ..	23%

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(1) Master Farmers undertake a three-year course of informal agricultural training with the local demonstrator.

It is also interesting to note that 32% of these participants reported some degree of contact with their local agricultural demonstrator.

The broad aim of the Domboshawa short courses, which were organised by the Department of Conservation and Extension, was to enable tribesmen to gain a better understanding of the underlying causes of erosion (arable and grazing) due to a lack of conservation farming, and to consider what they themselves could do about the situation in Mtoko. The course included lectures, discussions, demonstrations and visits to places of interest on the subjects of low agricultural productivity, erosion and its causes, improved conservation farming methods, and problem-solving-leading on to project planning in the context of the problems of the Mtoko district.

FOLLOW-UP to DOMBOSHAWA TRAINING

Specific follow-up extension work to the Domboshawa training courses was not possible in all Headmen's areas due to a shortage of agricultural demonstrators. Follow-up work was therefore concentrated in the three areas where there was a definite request for assistance. Emphasis was placed on the introduction of new crops - cotton and sorghum, and improving the basic practices in existing crops. Agricultural staff encouraged the development of and worked closely with farmers' interest groups and channelled all demonstration plot work to individual farmers through these groups. They also worked closely with Community Boards (ad hoc non-statutory bodies at sub-local government level (Headman area) established for relatively short-term projects) and, together with other government agencies, they assisted these bodies with technical advice and when necessary with project planning.

RESEARCH DESIGN and PROCEDURES

Owing to the practical problems of distance and the limited amount of time available the investigation was limited to the Agricultural Officer's area, which comprised approximately half of the total Mtoko district. This involved thirteen headmen (1). Of these, six had not attended Domboshawa courses, seven had attended courses, but of the latter one was considered to be unco-operative even after attending a training course. For this reason this particular headman's area was excluded from the sampling.

The remaining twelve Headman areas were then given one of three treatments:-

1. Six areas received no Domboshawa training and no agricultural extension follow-up (Control group).
2. Three areas received Domboshawa training but no agricultural extension follow-up.
3. Three areas received Domboshawa training plus agricultural extension follow-up.

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(1) Each Headman's area varies considerably in size, but in general consists of thirty (plus) kraals (villages) with about twenty-five plus homesteads ('families') in each kraal.

From each of these categories one Headman's area was selected for data collection. In the 'control' area, all cultivators were listed and the sample was drawn from these. In the two 'experimental' areas the samples were selected from those individuals who received the Domboshawa 'treatment'. Random number tables were used to select fifty cultivators for each of these samples.

The selected individuals provided data on contour construction and improved farm practices and yields. Information on problem-solving was collected for each selected area as a whole.

Data collection

The agricultural demonstrators working in each selected Headman's area were made responsible for data collection as part of their normal work. This involved training the demonstrators in each selected area in methods of data collection, and explaining the purpose of the investigation. Problems of data collection included deficiencies in previous records, shortage of time and distances involved, problems in framing questions in the vernacular, and overcoming the suspicions of respondents and their tendency to give 'expected' answers. Methods of collecting data were as follows:-

1. Mechanical conservation

Contours actually constructed by the individuals in the three samples since the first Domboshawa course in 1967 were measured by the local agricultural demonstrators (i.e., approximately a two-year period). A small number of these measurements were checked at random by the agricultural officer. It is considered that the sampling at this stage was carried out as planned and that the data collected is accurate.

2. Improved agricultural practices

The selected individuals were interviewed in their lands by the local demonstrator and questioned concerning the use of fertiliser. Plant population counts were then undertaken and crop yields were measured later in the season. These measurements were undertaken during the 1968/1969 agricultural season.

Owing to the pressure of other work it was not possible for the Agricultural Officer to keep as tight a control of the sampling (replacement of dropouts) and data collection (supervision and random checking) as considered desirable. For this reason sample numbers in this part of the investigation fluctuated between forty and sixty and it is thought that bias may also have been introduced by the demonstrators deliberately inflating the results achieved by cultivators who received agricultural extension follow-up in addition to Domboshawa training. These particular results are, therefore, mentioned later only as possible indications and must be viewed with caution. (1).

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(1) Some of the problems pertaining to agricultural sample surveys are discussed in some detail by A.A. le Roux 'Sample Survey Problems' Proceedings of the Rhodesian Economic Society No.9, December, 1964, pp.81 to 117.

However, data on yields per acre for the three groups was also gathered for the 1968/1969 'Sample study of crop and livestock variables in the TTLs' using the standard procedure suggested by the Central Statistical Officer. (1). Although the number of respondents in each sample was less than fifty (four farmers per demonstrator) it is considered that these figures are a more accurate indication of improved agricultural practices, because demonstrators do not regard crop census results as a measure of their own efficiency. However, as these respondents are only part of a larger national sample, there is a large sampling error if these figures are used as estimates for smaller areas. This data should also be viewed with caution although it appears to indicate a possible trend to improved agricultural practices in the 'experimental' areas.

3. Problem-solving

Data was collected from the monthly reports of the local agricultural demonstrators concerning the number of local projects completed in each selected Headman's area since the first Domboshawa courses in 1967. These projects included dams built, weirs built, demonstration plots, co-operative societies started and field days held. This data was cross-checked by the agricultural officer and is considered to be accurate.

ANALYSIS of RESULTS

Mechanical conservation

In 1967 the control of land allocation and its use reverted from the District Administration to the Tribal Land Authority in each area. In order to cope with the demands for pegging (survey and layout of contours, drainage strips and roads) Tribal Land Authorities were encouraged to employ peggers and to make a charge for pegging services. The average tribal farmer in Mtoko with about six acres of land needs to construct about 1,200 yards of contour to achieve optimum mechanical conservation of arable land.

Table 3 shows the mean number of yards of contour constructed by the farmers making up the three samples and the number of Chiefs' peggers employed by the Tribal Land Authority in each area up to June, 1969.

TABLE 3.

Yards of contour dug by individual peasant farmers during the period following attendance at short training courses and number of chiefs' peggers in each area up to June, 1969.

	Control Group No Training N=50	Domboshawa Training No follow-up N=50	Domboshawa Training Plus follow-up N=50
Mean yards of contour dug per farmer.	350	700	764
Number of Chiefs' peggers in each area.*	3	3	8

* These figures do not include a number of peggers operating in the Mtoko district who are employed by Government.

(1) The 1969 'National Survey' of TTLs was a joint exercise planned by the Department of Conservation and Extension and the Central Statistical Office, Salisbury. Two villages in each demonstrator's area were selected at random. All cultivators in the selected villages were listed and two from each village were selected, using random number tables.

Improved agricultural practices

Information gathered by demonstrators as part of the investigation appeared to show a definite improvement for the group which had received training at Domboshawa and extension follow-up in fertiliser use, groundnut plant population, increased acreages of cotton, sorghum and groundnuts, increased yields per acre of all crops and a surplus for sale outside the area of all crops except maize.

However, it has already been noted that both the sampling and data collection may be biased in favour of the group which attended Domboshawa and received agricultural extension follow-up.

For this reason data on crop yields per acre collected for the 1968/1969 crop census as part of 'The 1969 National Survey of TTLs' is preferred as an indication of improved agricultural practices. (1). Table 4 gives the average yields per acre for the most common crops grown in the area during the 1968/1969 season.

TABLE 4.

Average yields in bags per acre: Mtoko TTL 1968/1969 Season

(Data from 1968/1969 crop census: 1969 National Survey of TTLs).

	Maize	Mhunga (Millet)	Groundnuts
Control Group. N=28	3.5	2.00	0.50
Domboshawa Training: No follow-up. * N=16	3.25	3.00	1.00
Domboshawa Training: Plus follow-up. * N=28	13.50	8.50	3.00

* It should be noted that only a few of the individuals in these two 'experimental' samples actually attended a training course at Domboshawa.

(1) For comparison thirty 'Test Demonstration Plots' in Mtoko TTL during the 1968/1969 season gave the following yields (bags per acre).

Crop	Lowest yield	Highest yield
Maize	8	30
Cotton	700 lbs/acre.	1,800 lbs./acre.
Sorghum	1	29
Mhunga (millet).	0.75	9
Groundnuts.	0.75	7

Table 5 gives the average acreages planted for these crops, plus cotton and sorghum which were newly introduced into the area as part of the follow-up programme.

TABLE 5

Average acreages planted: Mtoko TTL 1968/1969 Season

(Data from 1968/1969 crop census: 1969 National Survey of TTLs).

	Maize	Mhunga (Millet)	Groundnuts	Cotton	Sorghum
Control Group. N=28	0.87	3.40	0.50	Nil	Nil
Domboshawa Training: No follow-up. N=16	1.50	3.10	0.75	Nil	Nil
Domboshawa Training: Plus follow-up. N=28.	1.25	2.50	3.00	1.00*	1.00

* Average yields of cotton were 1,500 lbs. per acre. There appears to be a trend by the group which received 'follow-up' away from the production of Mhunga (for subsistence) in favour of the cash crops - especially groundnuts and cotton and also sorghum to a lesser extent.

Further evidence related to improved agricultural practices, is derived from the number of agricultural loans issued to individuals in the three selected areas (loans for seasonal production granted by the Agricultural Loan Fund (ALF)) and the number of growers registered with the Grain Marketing Board (G.M.B.). Cotton is a relatively new cash crop in the area and all cotton growers must be registered with the GMB. All producers who wish to market grain direct to the GMB must also be registered. These figures are outlined in Table 6.

TABLE 6.

Number of ALF loans granted and number of GMB registered growers in selected Headmen's areas, Mtoko TTL 1968/1969.

	ALF Loans granted	Registered GMB growers
Control group.	14	10
Domboshawa Training: No follow-up.	18	24
Domboshawa Training: Plus follow-up.	75	50

Problem-solving

Progress in problem solving was assessed by the number of projects initiated and completed in each selected Headman's area as a whole.

Table 7 lists the number of completed projects for each area up to 30th June, 1969.

TABLE 7

Number of projects started and completed up to 30th June, 1969, in selected Headman's areas, Mtoko TTL.

Project	Control Group	Domboshawa Training No follow-up	Domboshawa Training Plus follow-up
Dams (1).	Nil	Nil	3
Weirs (1).	Nil	Nil	3
Demonstration Plots.	Nil	Nil	271
Co-operative Society established. (2).	Nil	Nil	1
Field Days.	Nil	1	23

(1) Dams and weirs are constructed to provide permanent water both for human use and livestock.

(2) Much of the area is over one hundred and twenty miles distance by road from Salisbury. Co-operative marketing and supply helps to alleviate the problem of accessibility to markets and supplies. There are now (1969) three Co-operative Societies and one Savings Club in the district.

It should be pointed out that although needs vary according to local circumstances, it is the author's impression that the broad problems are similar in each of the three areas selected for study. It is also considered that prior to involvement in the Domboshawa training courses there was no attempt to solve community problems by group or community action and that this was the situation which existed in all three areas.

It is realised that a possible criticism of the study is the concentration of staff in the areas which received follow-up subsequent to the Domboshawa training. The practical considerations of staff shortage and the fact that some areas were more quickly co-operative and receptive following training were determining factors in this regard. The other areas, including the 'nil treatment' area, are now (1969) showing increasing interest, and requests for training and follow-up extension work are increasing throughout the whole district.

DISCUSSION of FINDINGS and CONCLUSIONS

Mechanical conservation

The data derived from the original sample presented in Table 3 shows a definite trend amongst the people to construct contours in areas exposed to Domboshawa training. The increasing employment of chiefs' peggers indicates that the Chiefs and Headmen are now taking over the responsibility for soil conservation in their areas. This would have been considered impossible due to the resistance of the people to soil conservation, even as short a period as five years ago.

During the period when the Land Husbandry Act was implemented in Mtoko (1955 to 1961) 1,893 miles of grass buffer strips were contour-pegged by government agents but only 218 miles of these were actually constructed into contour ridges by the cultivators.

Since 1967 following the first of the Domboshawa courses 2,507 miles of contour have been pegged with 295 miles actually constructed. This is a greater length of contours actually constructed than was achieved during the whole period of the Land Husbandry Act and at considerably less cost to the government.

Although these results cannot be attributed entirely to Domboshawa training (other agencies and factors have also contributed), it is the author's opinion that this very marked change in attitudes and behaviour by Mtoko tribesmen to mechanical conservation is due largely to this new educational approach to soil erosion, and particularly to the involvement of the people in the problem and its solution.

Improved agricultural practices

The data regarding improved agricultural practices is rather patchy due to the personal involvement of demonstrators in the local situation which they were evaluating, together with inadequate time for sufficiently close supervision and random cross-checking by the author. Thus the data collected from the original sample is suspect and has been discarded.

However, it is considered that the data in Tables 4 and 5 is accurate although the sample sizes and method of sampling do not permit any meaningful statistical analysis. This data, which shows a trend to the adoption of improved practices by those who attended Domboshawa, and especially where there was subsequent follow-up in the field, must therefore be viewed with caution.

However, this possible trend to improved practices is confirmed by the figures on ALF loans and GMB registered growers in Table 6. This data has been checked and is accurate.

It is the author's impression that the greatest impact in improved agricultural practices is due to the Domboshawa training and that methods of extension follow-up could be made more effective.

Problem-solving

The data presented in Table 7 suggests that attendance by community leaders (and others) at short training courses is not sufficient in itself to lead to the initiation and completion of needed group and community projects.

Careful follow-up in the area seems to be an essential requirement to enable a community to take the necessary steps involved in problem-solving, leading on to project-planning and execution. This follow-up, after the initial motivation of the Domboshawa-type course, provides an essential communication link between the local people and government agencies which must necessarily be involved in such projects.

It is the author's opinion that most of these projects, involving co-operative action between local communities and government agencies, would not have been possible prior to the Domboshawa training courses - these created the initial awareness of problems and possible solutions in a way which would have been difficult to achieve at District level in Mtoko.

General conclusions

Although there are acknowledged weaknesses in the methods of sample selection (less progressive areas may have been self-selected as control areas) and data collection, these results suggest that the training courses at Domboshawa have played an important part in initiating increased mechanical conservation, improved agricultural practices, and problem-solving-reflected in group or community projects, in Mtoko TTL. However, this trend is much more definite in those areas which have received subsequent extension follow-up. (This could be narrowly interpreted as a response to increasing attention). It is the author's opinion that this type of institutional training is limited in value, even at the individual level, unless there are specific related follow-up activities channelled through groups such as the Tribal Land Authority, Co-operative Societies and Farmers' Clubs, etc.

Finally, this investigation has clearly underlined the need for further research - particularly into the training, supervision and organisation of agricultural field-workers to operate more effectively in tribal communities.

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Mr. G.A. Smith, of the Institute of Adult Education supervised the investigation and assisted in the preparation of this report.

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